Remarks

Status of the Claims

Claims 1-18 and 22-34 are pending in the application. Claims 19-21 have been withdrawn from present consideration, without prejudice to Applicant's ability to pursue the claims in another patent application. Claims 1-18 and 22-34 stand rejected under 35 USC §102(a) as being anticipated by Lee et al. (US Pat. No. 6,905,586) (hereinafter "Lee".)

Claims Rejections under 35 USC §102

The instant Action states that Lee anticipates an apparatus and methodology for sequencing polymer molecules, such as for performing DNA and/or RNA sequencing using nanoelectrode-gated tunneling current measurements, citing col. 7 line 30 through col. 14, line 4 (the entirety of Lee's "Detailed Description".) The Action asserts that Lee teaches all of the positively recited structure of the apparatus provided in the presently claimed inventive method, characterizing the claimed method as "merely...the conventional operation of that apparatus", and further states that the claimed process is anticipated by the "normal operation" of Lee's apparatus.

Applicant respectfully disagrees that Lee discloses use of his detector 67 in a manner recited in the present claims. Lee is directed to improving the controlled movement of molecules such as DNA through gaps between nanoelectrodes during nanoscale reading of nucleic sequences. (see Abstract) In fact, most of Lee's Detailed Description is directed to nanoelectrode fabrication and electrophoretic displacement of molecules through said electrodes. Lee discloses only a few general details with regard to his molecular detection techniques; those that are provided begin at col. 9, line 58 and end at roughly col. 11, line 37. Note that amended claim 1 begins by reciting an important limitation completely missing from the teachings or suggestions of Lee, particularly, "*centering a fixed bias voltage across a pair of nano-electrodes separated by a channel therebetween, the bias voltage corresponding to an energy difference between any two internal energy levels of a molecule of interest.*" The dithering of a fixed bias voltage tailored to energy level differences within a target molecule is simply not disclosed by Lee, and no other reference has been cited which discloses this approach. Lee discloses, as evident in

Figure 9b and associate text, only the use of a pure ac signal without biasing in his tunneling current, dielectric molecular characterization and AFM probing methodologies.

In addition, certain of Applicant's dependent claims (i.e., 8-14) recite the use of modulating waveforms in which harmonics have been suppressed, and of coherent demodulation of the detected current signal. These limitations are similarly neither taught nor suggested by Lee. Applicant also suggests that there is no such thing as "conventional" tunneling current detection, as asserted in the instant Action. Applicants approach, as described in the specification, does not involve direct current measurements, as Lee is doing.

In light of at least the foregoing, Applicant respectfully submits that the cited art fails to teach all the limitations of independent claims 1 and 22, as amended, and therefore requests reconsideration and withdrawal of the rejection under 35 USC §102(a).

Conclusion

Applicant believes that the claims are in condition for allowance. No additional fees are expected to be required. However, the Commissioner for Patents is authorized to charge additional fees or credit overpayment to Deposit Account No. 50-1078.

The following information is presented in the event that a call may be deemed desirable by the Examiner:

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Respectfully submitted,
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Dated: June 15, 2006 By: 

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